PHYSICAL MODEL OF HADRONS : BARIONS and MESONS. PHYSICAL ESSENCE of QUARKS and GLUONS AND PHYSICAL INTERPRETATION OF THEIR PARAMETERS.

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Abstract

The physical model (PhsMdl) of the hadrons is offered by means of the obvious analogy with the transparent surveyed PhsMdls of the vacuum and leptons in our recent works. It is assumed that the vacuum is consistent by dynamides, streamlined in junctions of some tight crystalline lattice. Every dynamide contains a neutral pair of massless contrary point-like (PntLk) elementary electric charges (ElmElc Chrgs): electrino (−) and positrino (+). By means of the existent fundamental analogy between their properties and behaviour we can understand the similarity and difference between them and assume that the quark parameter aroma is determined by the value of its size of its circular two-dimensional motion, while the quark parameter colour is determined by orientation of the flat of the same circular two-dimensional motion in the space. The colorless of the barions is explained by distribution of the same circular two-dimensional motion of its elementary electric charge within three mutually perpendicular flats. Then the exchange of the colors between two quarks with different colors within some hadron can be interpretated as some twisting of same hadron in the space. We give a new obvious physical interpretation of the charge values of quarks, which gives some explanation of angles of Cabibo and Weynberg. By some physical supposition about the structure of charged intermediate vector bozon W and uncharged intermediate vector bozon Z we have possibility to explain as the physical essence of the strong, weak and electromagnetic interactions, so the outline of all births, transformations and decays of the ElmPrts.

Although up to the present nobody of scientists distinctly knows are there some elementary micro particles (ElmMicrPrts) as a stone of the micro world and what the elementary micro particle (ElmMicrPrt) means, there exists an essential possibility for clear and obvious scientific consideration of the unusual behaviour of the quantized micro particles (QntMicrPrts). It is well known that the physical model (PhsMdl) presents at us as an actual ingradient of every good physical theory. It may be used as for an obvious visual teaching the occurred physical processes within the investigated phenomena, so for doing with them a bigger capacity of its physical understanding and mathematical description. All scientists think that the ElmMicrPrt display itself as united and indivisible everywhere and always, but nobody demand for ElmMicrPrt to have no structure. About thirty years ago in the early theory of the ElmMicrPrt some theoretical physicists assumed that all the ElmMicrPrts have point-like (PntLk)-fashion and their behaviour are no dependent on the presence of other ElmMicrPrt as neighbors. In further it was turned out that the existence of the strong interaction between hadrons and of their own magnetic dipole moment (MgnDplMmn) is caused by existence and exchange of the virtual pions between them. Really, the strong interaction between nearest hadrons is provided by the electromagnetic interaction, which is transferred by frequent exchanging a virtual charged pion ($\pi^{\pm}$-meson). The virtual charged pions ($\pi^{\pm}$-mesons), owing of its smallest mass between all other mesons, are most probable for a frequent birth from all other virtual ElmMicrPrts, which are caused by exchanged gluon within the quantized electromagnetic field (QntElcMgnFld).

We can assume without restriction that if the fine spread (FnSpr) elementary electric charge (ElmElcChrg) of every charged lepton participates in isotropic three-dimensional (IstThrDmn) relativistic quantized Schrodinger (RltQntSchr) self-consistent strong-correlated (SlfCnsStrCrr) solitary fermion vortical harmonic oscillations (SltFrmVrtHrmOscs) within its volume, then the FnSpr ElmElcChrg of every charged hadron participates successive in three anisotropic two-dimensional (AnIstTwoDmn) relativistic quantized (RltQnt) self-consistent strong-correlated (SlfCnsStrCrr) solitary fermion circular harmonic oscillations (SltFrmCrcHrmOscs) within its volume. If the RltQntSchr SlfCnsStrCrr SltFrmVrtHrmOscs can be approximately described by the orbital wave function (OrbWvFnc) of s-state ItsThrDmnNrlQnt boson harmonic oscillator (BsnHrmOsc), the AnIstTwoDmn RltQnt SlfCnsStrCrr FrmCrcHrmOscs can be approximately described by OrbWvFnc of p-state of AnIstThrDmn NrlQnt boson harmonic oscillator (BsnHrmOsc). Therefore we can assume that if the averaged FnSpr ElmElcChrg of charged lepton has one maximum, then the averaged FnSpr ElmElcChrg of charged hadron has three maximums, which can be identified as three FnSpr ElmElcChrgs of three quarks. But in a reality their is only one FnSpr ElmElcChrg within every charged hadron, which is determined by electric interaction only with the FnSpr ElmElcChrg of one maximum at a dispersion of passing charged leptons. Indeed, at every dispersion of some FnSpr ElmElcChrg of leptons from every hadron the FnSpr ElmElcChrg electromagnetically interacts (ElcMgnIntAct) only by one maximum of FnSpr ElmElcChrg of same hadron.

The existence of essential analogy between leptons and hadrons allows us to assume that the quarks for the hadrons are analogous of the neutrinos for the leptons. Therefore the physical means of the aroma of the quarks is analogous of the physical means of the aroma of the neutrinos, which is determined by the sizes of the vortical harmonic excitation of the neutral but fluctuating vacuum (FlcVcm). Because of that we can suppose that if the neutrino is an isotropic three dimensional solitary vortical excitation of a spherical symmetry of the neutral vacuum, then the quark is a two-dimensional flat circular soliton excitation of cylindrical symmetry of the same neutral vacuum. But if all the neutrino are very stable excitation without elementary electric charge (ElmElcChrg) and have unlimited time of live, all the quarks are unstable without ElmElcChgr and have limited time of live. Moreover we may assume also that if within some massive lepton (electron, muon (μ-meson), tauon (τ-meson)) its point-like (PntLk) ElmElcChrg takes part simultaneously in three one-dimensional very strongly correlated self-consistent fermion vortical harmonic oscillations along three axes, orientired mutually perpendicular one to another in the space, then within some massive charged hadron its PntLk ElmElcChrg or within other massive „uncharged" hadron its two opportunity PntLk ElmElcChrgs, take part successive in three two-dimensional very strongly correlated self-consistent fermion circular harmonic oscillations along three planes, orientired mutually perpendicular one to another in the space. Therefore we may naturally assume that three colours of the quark state correspond to three planes of motion of the PntLk ElmElcChrg, orientired mutually perpendicular one to another in the space.

If the lepton state of its PntLk ElmElcChrg is determined by one spherical state, describing the self- consist motion (Zitterbewegung) of its PntLk ElmElcChrg by one s-OrbWvFnc, then the hadron state of its PntLk ElmElcChrg is determined by three flat states, describing its three dimension motion, composed by three flat cylindrical harmonic motions by three p-

OrbWvFnc. Moreover, each p-state correspond to one quark state with one of three colours. Therefore the physical incomprehencible demand about colourless of the hadrons obtains quite obvious and clear physical interpretation about the demand of the spherical symmetry of three mutual perpendicular orientated flats of two-dimensional fermion circular harmonic oscillations in our PhsMdl. The change of the quark colour of the PntLk ElmElcChrg flat circular harmonic motion occurs through emission or absorption of some gluon (δ). When the PntLk ElmElcChrg of some hadron, moving within quark of some colour, absorbs some gluon (a quantized quasi-plane magnetic field), then this quarks changes his colour and the hadron as whole twists the flat of the two-dimensional fermion circular harmonic oscillations of his PntLk ElmElcChrg.

In the beginning for an explanation of the existent experimental date some theoretical physicists suppose that there are only three quarks and the same number antiquarks. But for physical explanation of new experimental date which are obtained during the carrying the following experiments, the scientists had need from new three quarks and the same number antiquarks. There are a common agreement that the existence of six quark (d,u,s,c,b,t) and the same number antiquark ($\tilde{d}, \tilde{u}, \tilde{s}, \tilde{c}, \tilde{b}, \tilde{t}$) is firmly determined by experimental research. Coming out from the supposed symmetry between leptons and quarks some theoretical physicists very frequently suppose a following list of their distribution on aroma:

$$\begin{vmatrix} \nu_e & \nu_\mu & \nu_\tau \\ e^- & \mu^- & \tau^- \\ u & c & t \\ d & s & b \end{vmatrix} \qquad\qquad \begin{vmatrix} \tilde{\nu}_e & \tilde{\nu}_\mu & \tilde{\nu}_\tau \\ \tilde{e}^- & \tilde{\mu}^- & \tilde{\tau}^- \\ \tilde{u} & \tilde{c} & \tilde{t} \\ \tilde{d} & \tilde{s} & \tilde{b} \end{vmatrix} \tag{1}$$

Indeed, we can suppose that owing of the strong localization of the PntLk ElmElcChrg of any massive hadron allow one to participate in very high frequency oscillations within very small area of the space, what secures the obtaining its QntElcMgnFld with very high electric and magnetic intensities and very dense electromagnetic energy, which same FnSpr ElmElcChrg borrows from the FlcVcm at its electromagnetic interaction with it by stochastic exchanging the virtual photons (VrtPhtns). Then it is obviously that the existence of the QntElcMgnFld with very high electric and magnetic intensities and very dense electromagnetic energy can secures the need probability for frequently births of virtual charged pions pairs within the immediate neighborhood of the PntLk ElmElcChrg's position. Therefore we mast suppose that the interacting hadrons are very quite near one to others. At these conditions we may suppose also that when some hadron (for example some proton) takes place in some nucleus and has as neighbors other hadrons with other isotopic spin (neurtons) then during the time of the motion of its PntLk ElmElcChrg within some u quark without changing its color, the hadron is visited by negative charged virtual pion (π^--meson), emitted by neighbor neutrons. Then both the free u-quark from the proton and the u-antiquark ($\bar{u}$- quark) annihilated and negative PntLk ElmElcChrg shifts from its d-quarks to the free d-quarks of the visited proton. After some time some gluon from FlcVcm generates another pair of u-quark and u-antiquark with another colour from the fluctuating vacuum (FlcVcm). Then the negative PntLk ElmElcChrg shifts itself from d-quark of the visited proton on the new born u-antiquark, which together with the d-quark of the old transferring negative charged pion (π^--meson) build a new negative charged pion. In the time of such a visit the positive PntLk ElmElcChrg uninterruptedly participated within the flat two-dimensional fermion circular harmonic oscillations within the u-quark of the visited proton. After the departure of the negative PntLk ElmElcChrg from the new neutron the positive PntLk ElmElcChrg shifts into the new born u-quark, which have the colour, different from the colour of old quark, from which it left. After such an exchange twisted proton is ready for a new visit from another negative virtual pion (π^-- meson). In such a natural way the exchange of the negative virtual pion between some pair of proton and neutron causes the existence of the strong interaction.

If the three different aroma of leptons correspond to three different sizes of the isotropic three dimensional relativistic quantized (IstThrDmnRltQnt) Schrodinger self-consistent strongly correlated (SchrSlfCnsStrCrr) solitary fermion vortical harmonic oscillations (SltFrmVrtHrmOscs) of its FnSpr ElmElcChrg, composed by three SlfCnsStrCrr one-dimensional relativistic quantized harmonic oscillations, then the three different aroma of hadron quark state correspond to three sizes of three two-dimensional relativistic quantized fermion circular harmonic oscillations of its FnSpr ElmElcChrg. Therefore we may suppose that if within the massive lepton its averaged (over spread (OvrSpr)) ElmElcChrg has one maximum only, then within the massive hadron its averaged OvrSpr ElmElcChrg has three maximums only, each of which may be identified by us as the ElcChrg of the quark or parton. The exchange of the FnSpr ElmElcChrg of its quark colour state occurs through absorption or emission of some gluon (δ).

The gluons are hypothetical particle, which exchange between two quarks with different colors (space orientations) achieve the strong interaction between them. It is turn out that they have not a ElmElcChrg and rest mass, but have a proper mechanical moment (spin) and quantized magnetic field with a proper magnetic dipole moment (MgnDplMmn). Therefore in magnetic interaction (MgnIntAct) between the QntMgnFlds of the gluon and quarks ensures the turn of space orientation (change of color) of gluon. It is turn that the impulse (mechanical momentum) sum of all gluons within some hadron is equal of the impulse sum of all quarks within same hadron. As the gluon spin is $1\hbar$, therefore at its habitual virtual decay within hadron one can turn into pair virtual quark and antiquark with paralel spins. But such a virtual pair is no virtual meson, as more mesons with small mass have a spin with a zero value. Therefore such a decay of some gluon into a pair of some virtual quark and antiquark could effectively turn upsite-down the spin of one of meson quark and in such a way enssure the decay of this meson in first into charged intermediate vector bozon W and in second into massive and massless leptons of equal aromas. The behavior of eight gluons can be described by eight Gell-Man's mathrices of SU(3) space.

We must note that the PntLk ElmElcChrg of the charged admeson is moving successively in two opposite orientated flats. As in positive π-meson its positive PntLk ElmElcChrg (positrino) is successively moving in an u-quark state and in a $\tilde{d}$-antiquark state, which have an opposite parallel orientations, then in negative π-meson its negative PntLk ElmElcChrg (electrino) is successively moving in a d-quark state and in a $\tilde{u}$ -antiquark state, which have opposite parallel orientations. In same way in the positive K-meson its positive massless PntLk ElmElcChrg (positrino) is successively moving in an u quark state and in a $\tilde{s}$-antiquark state, which have opposite parallel orientations, and in the negative K-meson its negative PntLk ElmElcChrg (electrino) is successively moving in a s-quark state and in a $\tilde{u}$-antiquark state, which have opposite parallel orientations. However in the neutral admesons two opposite charged PntLk ElmElcChrgs (electrino and positrino) are moving in four flats, which have in pair opposite parallel orientations, where are moving separately two opposite charged PntLk ElmElcChrgs. For instance in π^o-meson its massless electrino is moving in d-quark state and in $\tilde{u}$-antiquark state, which both have opposite parallel orientations, and its positrino is moving in u quark state and in $\tilde{d}$ antiquark state, which both have opposite parallel orientations, mutually perpendicular orientated to the first pair flats. In such a fashion in K^o -meson its electrino is moving in a d quark state and in a $\tilde{u}$-antiquark state, which both have opposite parallel orientations, and its positrino is moving in an u quark state and in $\tilde{s}$ antiquark state, which both have opposite parallel orientations, but the second are mutual perpendicular oriented to the first pair flats of moving electrino. In such a fashion in $\tilde{K}^o$- meson its electrino is moving in a s-quark state and in a $\tilde{u}$ antiquark state, which both have opposite parallel orientations, and its positrino is moving in an u quark state and in a $\tilde{d}$-antiquark state, which both have opposite parallel orientations, but the second are mutual perpendicular oriented to first pair flats of moving electrino. Owing of a small difference between the compositions of quarks, from which are built the K^o-meson and the $\tilde{K}^o$-meson the some fluctuations in the FlcVcm have energy, enough for their conversion one meson in its antimeson.

$$K^o(\,d\uparrow,\,\tilde{s}\downarrow\,) = (\,u\downarrow,\,W^-\uparrow,\,\tilde{s}\downarrow\,) = (\,u\downarrow,\,\tilde{c}\uparrow\,) = (\,s\uparrow,\,W^+\downarrow,\,\tilde{c}\uparrow\,) = \tilde{K}^o(\,s\uparrow,\,\tilde{d}\downarrow\,) \quad (2)$$

In a result of such mutual conversions are obtained short-lived and long-lived K^o-mesons with different parameters and scheme of decay.

$$K_l^o = \frac{(K^o + \tilde{K}^o)}{\sqrt{2}} \quad \textbf{and} \quad K_s^o = \frac{(K^o - \tilde{K}^o)}{\sqrt{2}} \quad (3)$$

The similar fashion of the meson construction we may find in the D^o-mesons, where its positive PntLk ElmElcChrg is successively moving in an u-quark state and in a $\tilde{d}$-antiquark state, which both have opposite parallel orientations, and its negative PntLk ElmElcChrg is successively moving in a d-quark state and in a $\tilde{c}$-antiquark state, which both have opposite parallel orientations, but the second are mutually perpendicular to first pair flats. In such a fashion in $\tilde{D}^o$-meson its electrino is moving in a d-quark state and in a $\tilde{u}$-antiquark state, which both have opposite parallel orientations, and its positrino is moving in a c quark state and in a $\tilde{d}$-antiquark state, which both have opposite parallel orientations, but the second are mutually perpendicular to first pair flats.

$$D^o(\,u\uparrow,\,\tilde{c}\downarrow\,) = (\,d\downarrow,\,W^+\uparrow,\,\tilde{c}\downarrow\,) = (\,d\downarrow,\,\tilde{s}\uparrow\,) = (\,c\uparrow,\,W^-\downarrow,\tilde{s}\uparrow\,) == \tilde{D}^o(\,c\uparrow,\,\tilde{u}\downarrow\,) \quad (4)$$

As for the radiation of the spontaneous real photon (RlPhtn) from the excitative atom it is necessary the presence of the virtual photon (VrtPhtn) for the creation of the electric dipole moment (ElcDplMm), so for the decay of a charged π-meson it is necessary the presence of a virtual gluon for an overturning of the spin of one of its quarks, by which charged π-meson turns into charged virtual ρ-meson, which can immediately decay into charged intermediate vector boson W. At the subsequent transfer of the in a pair of massive and massless leptons of equal aroma the participating in the decay gluon go back in the FlcVcm. Indeed, I think that instead of the equations of the incomprehencible decay :

$$\pi^+ \quad \Longrightarrow \quad W^+ \quad \Longrightarrow \quad \mu^+ + \nu_\mu \quad , \quad (5)$$

$$\pi^- \quad \Longrightarrow \quad W^- \quad \Longrightarrow \quad \mu^- + \tilde{\nu}_\mu \quad , \quad (6)$$

$$\pi^+ \quad \Longrightarrow \quad W^+ \quad \Longrightarrow \quad e^+ + \nu_e \quad , \quad (7)$$

$$\pi^- \quad \Longrightarrow \quad W^- \quad \Longrightarrow \quad e^- + \tilde{\nu}_e \quad , \quad (8)$$

$$\pi^o \quad \Longrightarrow \quad W^+ + W^- \quad \Longrightarrow \quad \gamma + \gamma \quad , \quad (9)$$

$$\pi^o \quad \Longrightarrow \quad W^+ + W^- \quad \Longrightarrow \quad \gamma + e^+ + e^- \quad , \tag{10}$$

we must used the following equations :

$$\pi^+ + \delta \quad \Longrightarrow \quad W^+ \quad \Longrightarrow \quad \mu^+ + \nu_\mu \quad , \tag{11}$$

$$\pi^- + \delta \quad \Longrightarrow \quad W^- \quad \Longrightarrow \quad \mu^- + \tilde{\nu}_\mu \quad , \tag{12}$$

$$\pi^+ + \delta \quad \Longrightarrow \quad W^+ \quad \Longrightarrow \quad e^+ + \nu_e \quad , \tag{13}$$

$$\pi^- + \delta \quad \Longrightarrow \quad W^- \quad \Longrightarrow \quad e^- + \tilde{\nu}_e \quad , \tag{14}$$

$$\pi^o \quad \Longrightarrow \quad W^+ + W^- \quad \Longrightarrow \quad \gamma + \gamma \quad , \tag{15}$$

$$\pi^o \quad \Longrightarrow \quad W^+ + W^- \quad \Longrightarrow \quad \gamma + e^+ + e^- \quad , \tag{16}$$

As it is easy to see from eqns.(15) and (16) that there is no necessity for participating some gluon δ in decay of the π^o-meson. For certain of that the half-life time ($\tau_\pi^+ = 2.6 \times 10^-8s$) of the charged π-mesons is very different from the half-life time ($\tau_\pi^o = 8.3 \times 10^-17s$) of the neutral π-mesons.

It seems to me the existance of two very interesting facts, having common physical cause.The first is concurrence of the energy of one degree of freedom in charged lepton μ-meson and in charged admeson π-meson. Indeed, if in isotropic three dimensional solitary vortical harmonic ocsillations of FnSpr ElmElcChrg of μ-meson have three degrees of freedom and therefore $3\,\hbar\,\omega = 2\,m\,C^2 = 213.2$Mev. Hence the energy of one degree of freedom can be determined $\frac{\hbar\,\omega}{2} = 35.5$Mev. If we take into consideration that the FnSpr ElmElcChrg of π-meson takes participation in two quasi-plane circular harmonic oscillations with opportunity orientations and therefore has energy $2\hbar\omega = 139.6$Mev. Hence the energy of one degree of freedom can be determined $\frac{\hbar\,\omega}{2} = 34.9$Mev. As we can see by comparision of two results this coincidence is very accurate. On this reason we can assume that the areas of their oscillations must also coincidence and therefore the OrbWvFnc of both FnSpr ElmElcChrg. May be therefore the decay of the positive (negative) charged π-meson in 100% occurs through the positive (negative) μ-meson and μ-neutrino (antineutrino) as we can see from (5, 6, 11, 12). This second coincidence gives us many correct answer of the question for inner structure of the elementary micro particles (ElmMicrPrts).

It is useful to remember that the existence of some analogy between leptons and hadrons allows us to assume that the quarks for the hadrons are analogous of the neutrinos for the leptons. Therefore the physical means of the aroma of the quarks is analogous of the physical means of the aroma of the neutrinos, which determines the sizes of the type excitation of the neutral but fluctuating vacuum (FlcVcm). Because of that we can suppose that if the neutrino is three dimensional spherical soliton seclusion excitation of the neutral vacuum, then the quark is the sum of two two-dimensional flat soliton excitation of same neutral vacuum. As the vacuum is formed by neutral dynamides, which are made from two contrary massless electric charges ((-) electrino and (+) positrino) through their dense streamlining, then its solution seclusion oscillation secures the joint motion of the oscillating FlcVcm and the PntLk

ElmElcChrg. However if the neutrino can accept the PntLk ElmElcChrg for an unlimited time at a creation of the massive lepton, then the quark can accept the PntLr ElmElcChrg only for a limited time t or 2t at every its visit, after which the PntLk ElmElcChrg must leave it and go on to another quark. In this a way every PntLk ElmElcChrg in every hadron continuously and alternately changes the quarks of the hadron, in which it temporary pass into. Therefore as we could see the average distribution of the spread electric charge, we think that the electric charge of one type quark is $\frac{1e}{3}$ and the electric charge of an other type quark is $\frac{2e}{3}$. The time of pass τ or 2τ of the PntLk ElmElcChrg within some quark area is determined in depending on the kind (symmetric or antisymmetric) of the neutral flat vortical oscillation of the FlcVcm. So any flat oscillation can be presented as a sum of two different flat oscillations, orientated in opposite directions. Therefore two kind of the quarks could be presented as symmetrical and antisymmetrical sums of two one-sided orientated protoquarks $|PK|$ and other-sided orientated antiprotoquark $|APK|$:

$$\begin{vmatrix} SC \\ ASC \end{vmatrix} = \begin{vmatrix} \cos(\theta_o) & \sin(\theta_o) \\ -\sin(\theta_o) & \cos(\theta_o) \end{vmatrix} \times \begin{vmatrix} PQ \\ APQ \end{vmatrix} \tag{17}$$

where the $|SC|$ means a symmetric combination of one-side flat oscillation of protoquark $|PQ|$ and of one-side flat oscillation of antiprotoquark $|APQ|$, while the $|ASC|$ means an antisymmertic combination of one-side flat oscillation of protoquark $|PQ|$ and of one-side flat oscillation of antiprotoquark $|APQ|$. If we assume that $\theta_o = 30^o$ then $\sin(\theta_o) = \frac{1}{2}$ and $\cos(\theta_o) = \frac{\sqrt{3}}{2}$. Therefore in this case we can obtain from (17) the following equation :

$$\begin{vmatrix} SC \\ ASC \end{vmatrix} = \begin{vmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{vmatrix} \times \begin{vmatrix} PQ \\ APQ \end{vmatrix} \tag{18}$$

Hence the angle θ_o determine the ratio of the participation of two oscillations. This interpretations help us to understand the physical mean of number $\frac{1}{3}$ and $\frac{2}{3}$. Indeed, if the $|SC|$ means the symmetric combination of two opposite orientated oscillations then the probability to find the PntLk ElcChrg in this state is determined by the difference of the quadrats of its amplitudes $\frac{3}{4}$ and $\frac{1}{4}$. By this natural way we have obtain the number $\frac{2}{4} = \frac{1}{2}$. Then, if the $|ASC|$ means the antisymmetric combination of two opposite orientated oscillations then the probability to find the PntLk ElcChrg in this state is determined by sum of the quadrats of its amplitudes $\frac{3}{4}$ and $\frac{1}{4}$. By this natural way we have obtain the number $\frac{4}{4} = 1$. Consequently the number $\frac{1}{3}$ and the number $\frac{2}{3}$ mean that the probability of finding the PntLk ElmElcChrg in the state of the SC is $\frac{1}{3}$ and the probability of finding the PntLk ElmElcChrg in the state of the ASC is $\frac{2}{3}$. Therefore we think that the values of the electric charges are $\frac{1e}{3}$ and $\frac{2e}{3}$.

By means of this our interpretation of our PhsMdl we can obtain the real values of the Weinberg angle and of the Cabibo angle. Indeed, in the probability of the finding the PntLk ElmElcChrg in the d quark state is equal of $\frac{1}{3}$ and the probability of the finding same PntLk ElmElcChrg in the u quark state is equal of $\frac{2}{3}$, then it is obviously clearly that the transition probability from one kind of the quark to another kind of quark is equal of their product. Therefore we have obtained that $\sin(\theta_w)^2 = \frac{2}{9}$ and $\sin(\theta_w) = \frac{\sqrt{2}}{3}$. Consequently, $\theta_w = \arcsin\frac{\sqrt{2}}{3}$ or $\theta_w = 28^o\, 8^,$.

In such a naturally easy, physically substantiated and mathematically correct way we have achieved Weinberg's angle values, which very well coincides with its value, determined by the experiment. It is very important that the value, $\tilde{\theta}_w = 38^o$, which is determined by means of the $SU(2) \times SU(1)$ group method, is very different from the experimental value.

We have explained that besides the colour the quark state has also the aroma, which difference ensures perfectly different properties of the quark state. We have supposed, that three different aroma of the quark correspond to three sizes of the two-dimensional flat fermion harmonic oscillations of its PntLk ElmElcChrg. It turns out that there are possibility enough to give us clear physical interpretation and mathematical substantiation for obtaining the Cabibo angle value, determined by experiment. Indeed, we may assume, that in a result of the different cover of the OrbWvFncs of different aroma of quarks, there will be different possibility for a transition of one aroma of quark in another aroma of quark with same ClcChrg. Some times this possibility is interpreted as a reflection of some mutual influence between them. Therefore we may assume that each quark is consists from quarks of different aroma but of same ElcChrg. In this supposing we may roughly write the following equations :

$$d_1 = d_o \cos\alpha + s_o \sin\alpha\,;\; s_1 = s_o \cos\alpha - d_o \sin\alpha\,; \tag{19}$$

$$u_1 = u_o \cos\beta + c_o \sin\beta\,;\; c_1 = c_o \cos\beta - u_o \sin\beta\,; \tag{20}$$

It is easy to verify that :

$$\tilde{u}_1 d_1 + \tilde{c}_1 s_1 = (\tilde{u}_o d_o + \tilde{c}_o s_o)\cos(\alpha-\beta) + (\tilde{u}_o s_o - \tilde{c}_o d_o)\sin(\alpha-\beta)\,; \tag{21}$$

$$\tilde{u}_1 s_1 - \tilde{c}_1 d_1 = (\tilde{u}_o s_o - \tilde{c}_o d_o)\cos(\alpha-\beta) - (\tilde{u}_o d_o + \tilde{c}_o s_o)\sin(\alpha-\beta)\,; \tag{22}$$

If we present the difference $(\alpha - \beta)$ as Cabibo angle θ_c then from eqns. (21) and (22) one becomes clear that at the participation of the quarks of equal aroma $(\tilde{u}_1 d_1 + \tilde{c}_1 s_1)$ and different aroma $(\tilde{u}_1 s_1 - \tilde{c}_1 d_1)$ in the weak interaction reaction, then Cabibo angle determines the decay probabilities with the hypercharge change and hypercharge conservation. Therefore Cabibo angle value is determined by equation $\sin\theta_c = \frac{2}{9}$ and $\theta_c = \arcsin\frac{2}{9} = 12^o\,50'$. In such a naturally, physically clear and mathematically substantiated way we have easy achieved Cabibo angle value 12.84^o which very well coincides with the value 12.7^o, determined by the experiment.

We assume that the proton is composed from one free positive PntLk ElmElcChrg, which visits consecutively two states of u-quark.The free u-quark and the $\tilde{d}$-antiquark are frequently visited by negative PntLk ElmElcChrg of virtual negative charged π^--mesons and the neutron is composed from two free opposite charged PntLk ElmElcChrgs, the positive one is oscillating in a state of u-quark and the negative one is oscillating in a state of two d-quarks. Very frequently the negative PntLk ElmElcChrg after forming the virtual negative charged point (π^--meson) by means of birthed pair of u-quark and $\tilde{u}$-antiquark owing of an absorption of some virtual gluon. The birthed by this way virtual negative pion can participate in strong interaction between very close neighbor proton and neutron by its exchanging.

However I have possibility to show and you to understand by means of some decay relation that negative charged intermediate vectorial boson W^- has spin minus $\hbar$,and the positive charged intermediate vectorial boson W^+ have a spin $\hbar$, while the neutral intermediate vectorial boson Z^o have a spin zero $\hbar$. Therefore the PntLk ElmElcChrg during the exchange of its self-consistent motions within one ElmMicrPrt and within other ElmMcrPrt transfers in a form of charged intermediate vectorial boson W. Indeed, the observing the law of total spin conservation at all decay with participating the weak interaction, when the PntLk ElmElcChrg takes the form of the charged intermediate vector boson $W^\pm$, causes fulfillment of some strong selection rules from all ElmMicrPrt. The consideration of spins of the quarks and charged intermediate vector bozon W allow us to understand why the positive charged intermediate vectorial boson W^+ emits only right quarks and selects only left quarks for participating with them in a weak interacting, while the negative charged intermediate vectorial boson W^- emits only left quarks and selects only right quarks for participating with them in a weak interaction. The neutral intermediate vector boson Z^o don't select the polarization of the quarks with which it participate in the weak interaction.

The weak interaction performs an important role in the relation between hadrons and leptons as it is display in nuclear β decay. Indeed, it is possible some a negative PntLk ElmElcChrg (electrino) of any neutron, which takes part within the oscillations of d-quark, to change its self-consistent motion and moves on the oscillations of $\tilde{u}$-quark, which are unstable and therefore it decay in a negative charged intermediate vector boson W^- and u-quark. In such a naturally way the neutron transforms itself in proton and the residual the negative charged intermediate vector boson W^- after its incorporation with some new created electron neutrino ν_e form the electron, while the other new created antineutrino $\tilde{\nu}_e$ go a free away. When some positive PntLk ElmElcChrg (positrino) of any proton, which takes part in the oscillations of the u-quark, changes his self-consistent motion and moves on the oscillations of the $\tilde{d}$-quark, which are unstable and therefore it decay in positive charged intermediate vector boson W^+ and d-quark. In such a naturally way the proton transforms itself in a neutron and the residual the positive charged intermediate vector boson W^+ after its incorporation with some new created electron antineutrino $\tilde{\nu}_e$ form the positron, while the other new created neutrino ν_e go a free away. Therefore the described β-transitions can be written in the following form :

$$n(u,d,d) \,=\, p(u,u,d) \,+\, W^- \,=\, p(u,u,d) \,+\, e^- \,+\, \tilde{\nu}_e \tag{23}$$

$$p(u,u,d) \,=\, n(u,d,d) \,+\, W^+ \,=\, n(u,d,d) \,+\, e^+ \,+\, \nu_e \tag{24}$$

As within the areas of every nucleon there are two virtual opposite charged π-mesons, at decreasing the distance between nucleons begins the creation of some correlation between their motions, which creates some decreasing of their total energy. At a rather decreasing of the distance between the nucleons begins some collectivization of all virtual charged π-meson. In this way we understand that internucleonic forces are analogous of interatomic Van-der- Waals force between neutral atoms.

Our PhsMdls explain as the structure of hadrons and the nature of their interaction so the existence of a possibility for joint description of a field and substantial form of the matter as unity whole in the physical science, which are submitted to an united, fundamental and invariable laws of nature.

As all existent ElmMicrPrts are excitement of the vacuum then all of them will move freely through one without any damping, that is to say without to feel the existence of the vacuum. Moreover, the existence of some McrPrt in the vacuum twists its cristalline lattice.This twist of the neutral vacuum excites the gravitation field of the ElmMicrPrt's mass, which will influence by using of some force upon mass of another ElmMicrPrt and upon its behaviour.

We can understand the physical essence of the hadrons and their structure and characteristics on these obvious representations. Our physical model explains as the structure of hadrons and the nature of their three type of interactions, so the existence of the possibility for a joint description of a field and substantial form of the matter as unity whole in the physical science, which are submitted to an united, fundamental and invariable laws of nature. By this natural way we can see the unity of the field charged and neutral excitations within the vacuum and its substantial charged excitations, offered by modernity relativistic quantum mechanics (RltQntMch), quantum electrodynamics (QntElcDnm) and quantum theory of field (QntThrFld).

I cherish the hope that this consideration of my physical model of the hadrons from my new point of view will be of great interest for all scientists. My very quality and good interpretation of behaviour and structure of hadrons and their interactions with its corresponding experimentally determined values gives us the hope for correctness of our beautiful, simple and preposterous physical model of hadrons and fine,extraordinary ideas,which have been inserted at its construction.

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